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Countercyclical taxes in a monopolistically competitive environment

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ABSTRACT

In the context of a neoclassical growth model with monopolistic competition, this paper studies the stabilizing effects of countercyclical tax policy when the income tax rate has an additional role of financing government budget deficits. Consistent with the conventional wisdom, countercyclical taxes generally reduce aggregate volatility, unless the fiscal response to debt accumulation is weak. The presence of monopoly power enhances these effects. Even when automatic stabilizers successfully stabilize business cycle fluctuations, countercyclical taxes are welfare inferior, due to reduced precautionary saving motives. While, if the fiscal response to debt is weak and countercyclical tax policy destabilizing, the increased precautionary saving motive is not welfare enhancing as the asset accumulated is government debt rather than capital. These results are generally robust. Nominal inertia may, however, dominate the precautionary saving mechanism.

1. Introduction

The conventional wisdom states that countercyclical fiscal policies have stabilizing effects which help smooth out business cycle fluctuations.[1] Supporting evidence comes primarily in the form of empirical estimates of various fiscal rules, with a focus on the effects of such policies on output volatility. There is also a general consensus that countercyclical fiscal policy is most effective when it works via automatic stabilizers, which do not require active intervention from policy makers and therefore do not suffer from implementation lags. The focus of this paper is on the automatic stabilizer element of tax policy, as captured by a progressive tax system. In a recession, the reduced income implies lower income tax rates, which attenuate the negative effects of the economic downturn. Furthermore, the relative effects of this automatic stabilizer on key macroeconomic variables will vary with the degree of monopoly distortion present in the economy. The presence of market power and profits in a monopolistically competitive environment affect the dynamics in the labor market, especially by altering labor supply incentives, and can have significant implications for the stabilizing effects of countercyclical taxes.

Countercyclical taxes also impact on the government budget deficit. During economic downturns, tax revenues are lower, due to both lower income and lower countercyclical tax rates. Debt-financing any such changes creates a dynamic link between current and future policies, as some aspects of future policy must adjust to balance the government budget in

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[1] See, for example, Auerbach and Feenberg (2000), Cohen and Follette (2000), Taylor (2000), Jones (2002), Auerbach (2003, 2005), Kletzer (2006) and Kim and Kim (2006).

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an intertemporal sense. This is important as expectations of future policies matter for the effectiveness of current policies.[2] For example, higher expected future tax rates have adverse effects on current saving decisions. Focusing on this intertemporal margin, Gordon and Leeper (2005) show that countercyclical policies can be counterproductive, exacerbating and prolonging the business cycle.

This paper brings together these aspects of policy. It investigates the stabilization role and welfare consequences of countercyclical tax policy in an environment distorted by monopolistic competition in the product market, and where the government uses a single instrument, the income tax rate, to achieve its countercyclical objective *and* to satisfy the intertemporal government budget constraint. This dual role of fiscal policy is relevant, for example, in countries belonging to a monetary union where national governments have no control over monetary policy and must rely exclusively on fiscal policies to attain their goals. Also, governments generally have a wide range of objectives but a limited (and smaller) range of instruments, so a "one instrument—multiple objectives" policy is more likely to be the norm, rather than the exception. The government in the model economy adopts an endogenous simple rule where, in a manner which mimics the progressivity of the tax system, the income tax rate responds positively to contemporaneous output fluctuations and positively to lagged changes in government liabilities. The policy is evaluated for a range of empirically relevant parameters values.

Three main conclusions emerge. First, while it is generally true that countercyclical taxes reduce the volatility of some aggregate variables like output, investment, and consumption, others show an increase. In particular, employment variability is found to vary *non-monotonically* with the income elasticity of the tax rate, increasing under plausible parameter configurations. Also, market imperfections matter for the stabilization effects of such policies.[3] The monopolistic competition distortion tends to enhance the stabilization effects of countercyclical taxes, relative to the case of perfect competition. In the labor market, results depend on the degree of fiscal response to debt: a smaller response makes employment more volatile under monopolistic competition, while a stronger response reverses the results.

Second, considering the stabilization role of fiscal policy in isolation, there is a direct welfare benefit from the reduced volatility. However, when people take direct account of the level of uncertainty when making decisions, then the reduced volatility lowers the precautionary saving motive. Since the only asset available to households is physical capital, the lower level of precautionary savings will reduce capital accumulation and, therefore, consumption in the long run. This second effect dominates in welfare calculations.

Third, when requiring taxes to adjust to ensure fiscal solvency, the strength of the tax rate adjustment to fulfil this role crucially impinges on the stabilization role of automatic stabilizers. A slow fiscal response to debt allows more medium-run debt accumulation and makes changes in aggregate variables highly persistent. Furthermore, countercyclical taxes become destabilizing. However, allowing for a stronger response restores the stabilizing properties of countercyclical taxes.[4]

In contrast to the results without government debt, the precautionary savings effects of increased volatility are not necessarily welfare improving when there is a slow fiscal response to debt. This is because substitution between assets leads to the accumulation of the riskless government bond and decumulation of capital, so that the long-run level of consumption is still lower under countercyclical taxes.

Along some dimensions, the results of this paper are broadly consistent with the conventional wisdom, as countercyclical tax rates do tend to lower volatilities. In the same time, it is pointed out that some variables of interest, like employment, may become more volatile, especially in the presence of market distortions. The results also highlight that precautionary saving motives, the nature of the assets into which such savings are channelled, and the associated long-run effects on consumption, are crucial in determining the welfare implications of government policies. In the absence of precautionary savings, the stabilizing effects of countercyclical policy would unambiguously improve welfare, as Kletzer (2006) finds in an environment without capital.[5] The precautionary savings mechanism may, however, be dominated by the costs of nominal inertia in a New Keynesian model with sticky prices. The welfare costs of nominal inertia in these types of models are, however, typically very high, such that their dominant effects may not be surprising.[6] Finally, the paper shows the importance of a careful consideration of debt dynamics.

The next section lays out the model, defines a symmetric equilibrium, and details the solution method and choice of parameter values. The direct effects of countercyclical taxes are presented in Section 3. Section 4 analyzes the interaction between the stabilizing role of taxes and their fiscal financing role. Section 5 looks at the sensitivity of the results with

[2] A selective list of articles which address this aspect includes: Bryant and Zhang (1996), Gordon and Leeper (2005), Leeper and Yang (2008) and Yang (2007).

[3] The role of frictions and distortions for the effects of tax policy is also discussed by Andres and Domenech (2006). They find that *constant* distortionary capital, labor, and consumption taxes help reduce output volatility (relative to lump-sum taxes), when rigidities due to price stickiness and investment adjustment costs are sufficiently large.

[4] The notion that a more aggressive fiscal adjustment to debt dynamics is beneficial is also present in Leeper and Yang (2008). However, in the context of a New Keynesian model with optimal monetary policy, it can be best to have a very small or mild fiscal feedback [Kollmann (2008), Schmitt-Grohe and Uribe (2007), and Kirsanova and Wren-Lewis (2007)]. These results are discussed in Section 4.1.

[5] The link between volatility and capital accumulation is present in Kim and Kim (2006) and Kollmann (2008) who, for certain specifications of their models, find that a countercyclical response of various distortionary taxes to exogenous technology shocks is optimal.

[6] This aspect is discussed further in Section 5.3.